

WHAT IS CLAIMED IS:

1. A process for reducing particle size of a drug, the process comprising
  - (a) dispersing about 10 g or less of the drug in a suitable volume of a liquid dispersion medium to form a suspension;
  - 5 (b) bringing together in a vessel grinding media, magnetically activatable means for stirring and the suspension;
  - (c) magnetically activating the means for stirring to effect milling of the suspension to a weight average particle size not greater than about 1  $\mu\text{m}$ ; and
  - 10 (d) separating the resulting milled suspension from the grinding media and the magnetically activatable means for stirring.
2. A process for reducing particle size of a drug of low water solubility, the process comprising
  - (a) dispersing about 10 g or less of the drug in a suitable volume of a liquid dispersion medium to form a suspension;
  - 15 (b) bringing together in a vessel grinding media, magnetically activatable means for stirring and the suspension;
  - (c) magnetically activating the means for stirring to effect milling of the suspension to a weight average particle size not greater than about 1  $\mu\text{m}$ ;
  - 20 (d) separating the resulting milled suspension from the grinding media and the magnetically activatable means for stirring.
3. The process of Claim 1 wherein about 5 g or less of the drug is dispersed in the liquid dispersion medium.
- 25 4. The process of Claim 1 wherein about 2.5 g or less of the drug is dispersed in the liquid dispersion medium.
5. The process of Claim 1 wherein the amount of liquid dispersion medium results, after the drug is dispersed therein, in a concentration of the drug in the liquid dispersion medium of about 0.1% to about 90% by weight.
- 30 6. The process of Claim 1 wherein the amount of liquid dispersion medium results, after the drug is dispersed therein, in a concentration of the drug in the liquid

dispersion medium of about 5% to about 65% by weight.

7. The process of Claim 1 wherein the amount of liquid dispersion medium results, after the drug is dispersed therein, in a concentration of the drug in the liquid dispersion medium of about 10% to about 50% by weight.
- 5    8. The process of Claim 1 wherein the liquid dispersion medium comprises water.
9. The process of Claim 1 wherein the liquid dispersion medium comprises a non-aqueous solvent.
10. The process of Claim 8 wherein the liquid dispersion medium further comprises at least one surface modifying agent.
- 10    11. The process of Claim 10 wherein the at least one surface modifying agent is present in a total amount of about 0.1% to about 90% by weight based on the combined weight of the drug and the at least one surface modifying agent.
12. The process of Claim 10 wherein the at least one surface modifying agent is present in a total amount of about 0.1% to about 50% by weight based on the combined weight of the drug and the at least one surface modifying agent.
- 15    13. The process of Claim 10 wherein the at least one surface modifying agent is present in a total amount of about 0.1% to about 25% by weight based on the combined weight of the drug and the at least one surface modifying agent.
14. The process of Claim 10 wherein at least one surface modifying agent is selected from the group consisting of sodium dodecyl sulfate, polyvinylpyrrolidone, hydroxypropylmethylcellulose, and hydroxypropylcellulose.
- 20    15. The process of Claim 10 wherein the liquid dispersion medium further comprises at least one antifoaming agent.
16. The process of Claim 10 wherein the at least one antifoaming agent is present in the liquid dispersion medium in a total amount of about 0.001% to about 2.5%, by weight.
- 25    17. The process of Claim 10 wherein the at least one antifoaming agent is present in the liquid dispersion medium in a total amount of about 0.003% to about 1%, by weight.

18. The process of Claim 15 wherein the at least one antifoaming agent comprises a silicon-based polymer.
19. The process of Claim 18 wherein the at least one antifoaming agent is selected from the group consisting of simethicone, Sigma® Antifoam A, and equivalents thereto.  
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20. The process of Claim 1 wherein the grinding media comprise a material selected from the group consisting of glass, lead-free glass, zirconium oxide and latex.
21. The process of Claim 1 wherein the grinding media comprise lead-free glass.
22. The process of Claim 1 wherein at least a substantial portion of said grinding  
10 media are in the shape of a sphere.
23. The process of Claim 22 wherein said sphere-shaped grinding media have a weight average diameter of about 0.2 to about 5 mm.
24. The process of Claim 22 wherein said sphere-shaped grinding media have a weight average diameter of about 0.33 to about 1.5 mm.
- 15 25. The process of Claim 21 wherein the sphere-shaped grinding media have a weight average diameter of about 0.5 to about 1 mm.
26. The process of Claim 1 wherein the weight ratio of the suspension to all of said grinding media is about 1:10 to about 1:1.
27. The process of Claim 1 wherein the weight ratio of the suspension to all of said  
20 grinding media is about 2:10 to about 9:10.
28. The process of Claim 1 wherein the weight ratio of the suspension to all of said grinding media is about 4:10 to about 8:10.
29. The process of Claim 1 wherein the magnetically activatable means for stirring comprises a magnetic stir bar.
- 25 30. The process of Claim 1 wherein the magnetically activatable means for stirring comprises a high strength magnetic stir bar.
31. The process of Claim 30 wherein the high strength magnetic stir bar is comprises one to a plurality of magnets comprising neodymium.
32. The process of Claim 30 wherein the high strength magnetic stir bar comprises

one to a plurality of NdFeB magnets.

33. The process of Claim 1 wherein said step (c) is performed by placing a rotating magnet near the vessel.
34. The process of Claim 1 wherein said step (c) is performed until substantially all  
5 of the drug particles have been reduced to a size not greater than about 1  $\mu\text{m}$ .
35. The process of Claim 1 wherein said step (c) is performed until the drug particles have been reduced to a weight average particle size of about 10 to about 1000 nm.
36. The process of Claim 1 wherein said step (c) is performed until the drug particles  
10 have been reduced to a weight average particle size of about 100 to about 1000 nm.
37. The process of Claim 1 wherein said step (c) is performed until the drug particles have been reduced to a weight average particle size of about 400 to about 900 nm.
- 15 38. The process of Claim 1 wherein said step (c) is performed until the drug particles have been reduced to a weight average particle size of about 500 to about 900 nm.
39. The process of Claim 1 wherein said separation step (d) comprises filtration.
40. The process of Claim 1 wherein said filtration step (d) comprises centrifugal  
20 filtration.
41. The process of Claim 1 wherein said separation step (d) comprises removal of the suspension from the milling vessel with a pipette.
42. The process of Claim 1 further comprising diluting the milled suspension with at least one pharmaceutically acceptable excipient to form a pharmaceutical  
25 suspension.
43. The process of Claim 1 further comprising drying the milled suspension to form a drug powder.
44. The process of Claim 43 wherein the drying step is performed by evaporation, spray drying, rotovapping, lyophilization, or heating in an oven.

45. The process of Claim 43 further comprising mixing the drug powder together with one or more excipients to form a powder blend.
46. The process of Claim 43 further comprising compressing or encapsulating the powder blend to form a solid dosage form.
- 5 47. The process of Claim 43 further comprising granulating the powder blend to form a granulate prior to compressing or encapsulating.
48. The process of Claim 47 wherein granulating is performed by wet granulation to form a wet granulate, and wherein the wet granulate is dried prior to compressing or encapsulating.
- 10 49. The process of Claim 43 further comprising suspending the drug powder in an inert liquid vehicle to form an imbibable liquid.
50. The process of Claim 49 wherein the inert liquid vehicle is water or fruit juice.
51. A pharmaceutical suspension prepared according to Claim 42.
52. A powder blend prepared according to Claim 45.
- 15 53. A solid dosage form prepared according to Claim 46.
54. An imbibable liquid prepared according to Claim 49.
55. An imbibable liquid prepared according to Claim 50.